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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,806	10/14/2003	Songgang Qiu	53353-8	1689

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EXAMINER	
MULLINS, BURTON S	

ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 08/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/684,806	**Applicant(s)** QIU, SONGGANG	
	Examiner Burton S. Mullins	**Art Unit** 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6,7,9-15,17,18 and 20-24* is/are rejected.

7)☒ Claim(s) *5,8,16 and 19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 14 October 2003 has been considered by the examiner.

Claim Rejections - 35 USC § 112

2. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Recitation "while limiting rotational movement of the mover more than the distance of the gaseous gap existing between the correspondingly positioned ones of the inwardly facing surfaces of the magnetic material and the outwardly facing surface portions of the mover" is vague and indefinite since it is not clear how an apparent limit to rotational movement can be defined as "more than" a particular distance. Should this be —no more than—, as in claim 24?

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-2, 4, 6, 10-13, 15, 17 and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Wu et al. (DE 10055080). Wu teaches a linear electrodynamic system

comprising: a housing (inherently part of stator 10), a longitudinal shaft 13 movably coupled to the housing to longitudinally and linearly reciprocate relative to the housing in the longitudinal direction of the shaft (Figs.2&3); a stator 10 rigidly coupled to the housing, the stator shaped to define an inner space (not numbered, see Figs.2&3) to receive a portion of the longitudinal shaft, the stator having stator poles 11 extending inwardly toward that portion of the longitudinal shaft received by the stator, windings 14 wound around the stator poles 11 (Figs.2&3); magnetic material, i.e., permanent magnets 15 affixed to a portion of each of the stator poles 11 (Figs.2&3), the magnetic material 15 having bore surfaces facing inward (inherent, Figs.2&3), and a mover, i.e., oscillator 12 (comprising arms 121) affixed to the shaft 13, the mover 12 having bore surfaces (generally corresponding to arm side surfaces 121a/121b in Fig.2) facing outward in correspondence with the bore surfaces of the magnetic material to define a gaseous gap 17 between each of the correspondingly positioned ones of the bore surfaces of the magnetic material 15 and the mover 12 (Figs.2&3), portions of the bore surfaces of the magnetic material 15 being closer to the shaft 13 than portions of the bore surfaces 121a/121b of the mover 12 (see Figs.2&3).

Regarding claims 2, 4 and 6, the bore surface of each magnetic material 15 affixed to a portion of one of the stator poles has a convex shape, in particular a V-shape, as seen in Figs. 2&3.

Regarding claim 10, note that Wu also comprises portions of the bore surfaces of the magnetic material 15 being the same distance from the shaft as portions of the bore surfaces 121a/12b of the mover 12 (Figs.2&3).

Regarding claim 11, as best understood, the mover 12 is positioned within the inner space of the stator 10 for longitudinal and linear reciprocal movement therein, with the magnetic material 15 positioned on the stator poles 11 within the inner space to permit uninhibited longitudinal and linear reciprocal movement of the mover 12 within the inner space while limiting rotational movement of the mover 12 to no more than the distance of the gaseous gap 17 existing between the correspondingly positioned ones of the inwardly facing surfaces of the magnetic material 15 and the outwardly facing surface portions 121a/121b of the mover 12.

Regarding claims 12-13, 15 and 17, Wu's bore surfaces of the magnetic material 15 and the mover 12 have mating non-annular shapes, i.e., convex, V-shapes.

Regarding method claims 21-24, since Wu's apparatus meets all the structural limitations, it inherently meets the generic method steps claimed.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3, 7, 9, 14, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. Wu's magnetic material 15 does not have an arc or parabolic shape, per se. However, Wu states that variations to the air gap shape are possible, in

particular the side portions 121a/121b need not be parallel to one another, but could be wedge-shaped, divergent or convergent (c.4, lines 19-30). Thus, one of ordinary skill could infer that the magnetic material portions 15 may assume various shapes such as arcs or parabolas. It would furthermore have been obvious to modify Wu and provide an arc or parabolic shaped magnetic material portion since it has been held that changes in shape involve ordinary skill. In re Dailey, 149 USPS 47 (CCPA 1976).

Allowable Subject Matter

7. Claims 5, 8, 16 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Regarding claims 5, 8, 16 and 19, the prior art, in particular Wu, does not teach that the bore surface of each magnetic material affixed to a portion of one of the stator poles has a concave shape. Rather, Wu's stator pole magnetic material surfaces are convex. Even though Wu's stator pole magnetic material may assume different shapes, it is considered that the shapes would all be convex, since there are no concave examples shown, discussed or implied. Goesling et al. (GB '643) teaches a linear motor with concave magnetic material pole faces 22 (Fig.1); however, there is no teaching or suggestion in Goesling et al. which would motivate one to employ such a structure in Wu. Yatsuzuka et al. (US '972) in Fig.5 teaches a concave pole face structure 131b-134b similar to Goesling, but provides no motivation to combine with Wu.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 571-272-2029. The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on 571-272-2034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Burton S. Mullins
Primary Examiner
Art Unit 2834

bsm
July 30, 2004